FARMINGDALE STATE COLLEGE

DEPARTMENT: PSYCHOLOGY  PREPARED BY: PSYCHOLOGY DEPT.
DATE: FALL 2017

COURSE TITLE: Introduction to Human Factors

COURSE CODE: PSY 328

CREDITS: 3

CONTACT HOURS: 45

CATALOG DESCRIPTION:

This course will provide an introduction to the field of human factors psychology. Human factors psychology is the application of the body of scientific facts about human characteristics to the design, operation and organization of human machine systems. Human-machine systems can range from simple consumer products to complex arrangements of hardware, software and personnel, such as aviation systems. Human factors knowledge, methods and techniques will be surveyed with an emphasis on ensuring that the systems, equipment, personnel tasks and work environment are compatible with the human sensory, perceptual, cognitive and physical attributes of the personnel who function within the human machine system. Prerequisite(s): PSY 101. Credits: 3 (3,0)

PREREQUISITES: PSY 101, PSY 130 or PSY 131, or permission of the Department Chairperson

REQUIRED FOR: Applied Psychology Program

ELECTIVE FOR: All curricula with upper level social science electives.


Introduction to Human Factors

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Behavioral Objectives

1. The student will acquire knowledge of the purpose of human factors and the role that psychologists play in system design and evaluation.

3. The student will understand the basic methods used in human factors psychology for research, design, and evaluation.

3. The student will be familiar with the theories and processes linking human characteristics and functions to system characteristics and functions. These relationships contribute to understanding the psychological and behavioral basis for system design and operation.

4. The student will obtain an understanding of approaches to system safety and the aspects of human-machine performance that may create unsafe situations and foster human error.

5. The student will become familiar with selected applications of human factors psychology to complex systems and the major issues being addressed.

COURSE OUTLINE

The following is an overview of the topics to be covered in this course. Each unit will include relevant theory, current research, and its application.

Unit 1: Introduction to Human Factors Psychology

The central focus of human factors is the design and evaluation of objects, facilities, and environments that people use in various aspects of their lives. The objective of human factors psychology is to ensure that these objects, facilities, and environments are designed to enhance their functional effectiveness (are designed to accommodate human strengths and weaknesses) and safety. In this unit, the general concept of human factors psychology and its role in the design and evaluation of human-“machine” systems will be presented. The sub disciplines of human factors, ranging from biomechanics to cognitive engineering, will be discussed.
Unit 2: Research, Design, and Evaluation Methods
In this unit, the methodology used by human factors specialists to conduct research, design systems, and evaluate systems will be presented. Also considered will be simulation tools, databases, and information sources used by human factors psychologists.

Unit 3: Models of Human-Machine Systems
Most systems have certain general characteristics: a mission or purpose, operational functions and components, inputs and outputs, communication links, and procedures. In this unit an overview of various types of systems, from simple consumer products, to traffic systems, to complex systems such as aircraft, will be discussed.

Unit 4: Information Processing and Display Design
One important aspect of human-machine systems is the information or display system. The function of this system is to provide information to users about important characteristics and states of system functioning. The design of effective information systems must consider the characteristics of human information processing. In this unit human information processing will be presented and its relationship to display design will be discussed. Research describing the factors governing this relationship, relating to sensation, perception, and cognitive processes will be reviewed.

Unit 5: Motor Response and Control System
Users must be able to control the system in order to guide it to achieve its intended purpose. The control of systems depends, in part on human motor control capabilities. In this unit, the concept of motor control will be presented and research related to its relationship to system control will be discussed. The range of human involvement in systems such as (1) manual control (under total human control), (2) supervisory control (joint human and system control), and (3) automation (system control) will be reviewed.

Unit 6: Anthropometry, Biomechanics, and Work Space Design
In this unit, the factors of anthropometry and biomechanics in design will be presented. Anthropometry is the study of human size and shape. Biomechanics is the study of human motion and strength. These aspects of human physiology are important considerations in the design of work spaces, such as computer workstations, aircraft cockpits, and power plant control rooms. The application of research on anthropometry and biomechanics to the design of workspaces will be presented.

Unit 7: Environmental Factors, Work Physiology and Stress.
Human work activity takes place in an environmental context, whether in a control environment such as a control room, or an uncontrolled environment, such as the outdoors. In this unit, the research on the effects of environmental factors on human physiology and work will be presented. Conditions that provide environmental stress will be discussed along with factors that may help mitigate such effects.
Unit 8: **Safety, Accidents, and Human Error**
An important contribution of human factors psychology is the consideration of human safety in the workplace and in the design of systems to prevent human error and accidents. In this unit, theories and research on the physical and cognitive basis for human error will be presented. The use of this knowledge to reduce human error and promote safety will be discussed.

Unit 9: **Selection, Training, and Social Factors**
Complex human-machine systems are operated and maintained by skilled personnel. In this unit, the selection and training of personnel will be discussed. Research related to the social factors governing the performance of personnel while engaged in system operation will be reviewed.

Unit 10: **Applications**
Human factors is applied in many industrial domains. In this unit, some of these domains will be examined, including aviation, transportation, medicine, computer-systems, and energy. The contributions of human factors psychologists and the major challenges currently being addressed within each of these domains will be discussed.